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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/582,268

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Yasufumi Nishii

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EXAMINER

LIU, MICHAEL

ART UNIT

PAPER NUMBER

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/582,268	<b>Applicant(s)</b> NISHII ET AL.	
	<b>Examiner</b> Michael Liu	<b>Art Unit</b> 2851	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 May 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                        |                                                                   |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/9/06, 10/19/06, 5/16/08</u> .                               | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. Receipt is acknowledged of the Amendment filed 5/16/08. Claims 1-16 are amended, and claims 17-20 are newly added by this amendment.

#### ***Information Disclosure Statement***

2. The information disclosure statements (IDS) submitted on 6/9/06, 10/19/06, and 5/16/08 are now in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements are being considered by the examiner.

#### ***Specification***

3. The amendment to the title has been considered, and therefore, the objection to the title has been withdrawn.

#### ***Claim Objections***

4. The amendments to the claims have been considered, and therefore, the previous claim objections have been withdrawn.

#### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-5, 8-13, 17, and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Garcia et al (6,988,327).

**Re claim 1:** Garcia discloses a stage apparatus [Fig 5i] comprising:

a holder [C17L19-21: wafer holding device] having a substrate holding surface [edge grip] on which a substrate 108 is held, there being a gap 110a along an outer circumferential part of the substrate held on the holder;

a lyophilic portion 110 [C18L44-45: hydrophilic material] that is disposed in a vicinity of the holder and that is disposed below a surface of the substrate held by the holder in the vicinity of the holder [see Fig 5N-2: lower surface of edge platform 110 lower than wafer 108]; and

a recovery device 110c that recovers a liquid leaked from the gap using the lyophilic portion 110 [C20L44-46].

**Re claim 2:** wherein the recovery device 110c has a suction device 110d that suctions the liquid guided to the lyophilic portion 110 [C20L45: vacuum].

**Re claim 3:** wherein suction force of the suction device by which the liquid is recovered is greater than suction force by which the substrate is held on the holder. [There is no suction force by the holder since it holds the substrate using an edge grip (C17L19-21); therefore, the suction force of the vacuum source 110d inherently is greater.]

**Re claim 4:** wherein the suction device includes a passage 110e disposed below the lyophilic portion 110, and the lyophilic portion has an inclined portion 110f, which is inclined toward the passage of the suction device 110d [see Fig 5N-2].

**Re claim 5:** wherein the lyophilic portion has a first portion 110b that is higher than the substrate holding surface. [See Fig 5N-2: The edge 110b is higher than the wafer 108; therefore, 110b is also higher than the edge grip, which is level to the wafer.]

**Re claim 8:** wherein the recovery device 110c has a surface that is substantially parallel to the substrate holding surface [see Fig 5N-2: inlets 110c parallel to wafer 108, which is inherently parallel to the edge grip to receive adequate support], and at least a part of which is liquid repellent. [Wafer 108, which is part of, or connected to, the edge grip, is hydrophobic (C18L10-13), or liquid repellent.]

**Re claim 9:** wherein at least a part of the holder is liquid repellent. [Wafer 108, which is part of, or connected to, the wafer holding device, is hydrophobic (C18L10-13), or liquid repellent.]

**Re claim 10:** wherein the substrate holding surface is liquid repellent. [Wafer 108, which is part of, or connected to, the edge grip, is hydrophobic (C18L10-13), or liquid repellent.]

**Re claim 11:** wherein the lyophilic portion 110 is disposed so that a space 110a is formed between the outer circumferential part of the substrate and the lyophilic portion [see Fig 5i].

**Re claim 12:** wherein a portion of the holder that opposes the lyophilic portion is liquid repellent. [Wafer 108, which is a portion of the wafer holding device, is hydrophobic (C18L10-13), or liquid repellent.]

**Re claim 13:** Garcia discloses an exposure apparatus [Fig 5J], comprising:  
a stage apparatus according to claim 1,

wherein a substrate 108 held on a holder [C17L19-21: wafer holding device] of the stage apparatus is exposed [to proximity heads 106].

**Re claim 17:** wherein the lyophilic portion 110 has an inclined surface 110f which is downwardly inclined in a direction away from the substrate 108 held on the holder [see Fig 5N-2].

**Re claim 18:** a flat surface 110 which is provided around the holder, and which is substantially flush with the surface of the substrate 108 held on the holder [C17L7-8], wherein the recovery device 110c recovers, using the lyophilic portion 110, the liquid which has leaked from a gap 110a between the flat surface and the surface of the substrate held on the holder [see Fig 5N-2].

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garcia in view of Lof et al (2004/0160582).

**Re claim 6:** Garcia discloses wherein the recovery device has a recessed portion 110c that suctions the liquid through the capillary-like tube 110f. Garcia does not disclose expressly that the suction is done by the capillary phenomenon.

Lof teaches, in Par 0128, that capillary action is used to transport the liquid through the gap.

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to recognize that the liquid of Garcia is suctioned by the capillary phenomenon, for the purpose of effectively withdrawing the excess liquid from the wafer cleaning and drying system.

**Re claim 7:** Garcia discloses wherein at least a part of the recessed portion 110c is lyophilic. [C18L44-45: Edge platform 110, which is the outer part of the multiple inlets 110c, is hydrophilic.]

9. Claims 1, 2, 4, 6, 7, 9, and 11-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lof in view of Hayashi et al (2001/0035897).

**Re claim 1:** Lof discloses a stage apparatus [Fig 11] comprising:

a holder WT having a substrate holding surface 20 on which a substrate W is held, there being a gap along an outer circumferential part of the substrate held on the holder;

a portion 65 that is disposed in a vicinity of the holder and that is disposed below a surface of the substrate held by the holder in the vicinity of the holder; and

a recovery device 65 that recovers a liquid leaked from the gap using the lyophilic portion.

Additionally, Lof discloses, in Par 0157, a hydrophobic layer 60 near the atmosphere 65. The layer repels liquid to the atmosphere 65, where the liquid can be collected, as seen in Fig 11.

Lof does not disclose expressly the portion being lyophilic.

However, Hayashi teaches, in Par 0145, the inner surface of the feed tube is rendered hydrophilic to permit the liquid to be conducted efficiently.

Therefore, at the time the invention was made, it would have been obvious to one of ordinary skill in the art to coat the surface of the atmosphere 65 of Lof hydrophilic, as taught by Hayashi, to complement the hydrophobic layer 60, for the purpose of attracting the liquid to accumulate in the atmosphere 65 and to reduce the staying of bubbles [Par 0145].

**Re claim 2:** Lof as combined discloses all limitations of the claimed invention except for the recovery device having a suction device.

However, Lof, in the third embodiment, teaches a vacuum source via port 46 to remove undesired liquid.

At the time the invention was made, it would have been obvious to add a vacuum source via port 46 at the bottom of the atmosphere 65, for the purpose of effectively dispelling liquid away from the substrate table.

**Re claim 4:** Lof as combined discloses wherein the suction device 46 includes a passage disposed below the lyophilic portion 65, and the lyophilic portion has an inclined portion, which is inclined toward the passage of the suction device [see Fig 11].

**Re claim 6:** Lof as combined teaches wherein the recovery device has a recessed portion 65 that suctions the liquid [by vacuum source via port 46] through the capillary-like tube [top of 65]. Lof does not disclose expressly the suction is performed by the capillary phenomenon.



However, Lof teaches, in the third embodiment in Par 0128, that capillary action is used to transport the liquid through the gap.

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to recognize that the liquid is suctioned by the capillary phenomenon, for the purpose of effectively withdrawing the excess liquid from the substrate table.

**Re claim 7:** Lof as combined discloses wherein at least a part of the recessed portion 65 is lyophilic.

**Re claim 9:** Lof discloses at least a part 60 of the holder WT is liquid repellent [Par 0157: hydrophobic].

**Re claim 11:** Lof as combined discloses wherein the lyophilic portion 65 is disposed so that a space is formed between the outer circumferential part of the substrate W and the lyophilic portion 65 [see Fig 11].

**Re claim 12:** Lof as combined discloses wherein a portion 60 of the holder WT that opposes the lyophilic portion is liquid repellent [Par 0157: hydrophobic].

**Re claim 13:** Lof discloses an exposure apparatus [Fig 1], comprising:

a stage apparatus according to claim 1,

wherein a substrate W held on a holder WT of the stage apparatus is exposed.

**Re claim 14:** Lof discloses an exposure method [see Fig 1] comprising:

holding a substrate W on a holder WT, there being a portion 65 disposed below a surface of the substrate held by the holder in a vicinity of the holder [see Fig 11];

supplying a liquid 11 to the substrate; and

exposing the substrate held by the holder through the liquid.

Additionally, Lof discloses, in Par 0157, a hydrophobic layer 60 near the atmosphere 65. The layer repels liquid to the atmosphere 65, where the liquid can be collected, as seen in Fig 11.

Lof does not disclose expressly the portion being lyophilic.

However, Hayashi teaches, in Par 0145, the inner surface of the feed tube is rendered hydrophilic to permit the liquid to be conducted efficiently.

Therefore, at the time the invention was made, it would have been obvious to one of ordinary skill in the art to coat the surface of the atmosphere 65 of Lof hydrophilic, as taught by Hayashi, to complement the hydrophobic layer 60, for the purpose of attracting the liquid to accumulate in the atmosphere 65 and to reduce the staying of bubbles [Par 0145].

**Re claim 15:** Lof as combined discloses recovering part of the liquid using the lyophilic portion. [See Fig 11: The atmosphere 65 recovers the liquid 11.]

**Re claim 16:** Lof discloses wherein a part 60 of the holder is liquid repellent [Par 0157: hydrophobic].

**Re claim 17:** Lof as combined discloses wherein the lyophilic portion 65 has an inclined portion which is downwardly inclined in a direction away from the substrate W held on the holder WT [see Fig 11].

**Re claim 18:** Lof as combined discloses a flat surface 117 which is provided around the holder WT, and which is substantially flush with the surface of the substrate W held on the holder,

wherein the recovery device 65 recovers, using the lyophilic portion, the liquid which has leaked from a gap between the flat surface and the surface of the substrate held on the holder [see Fig 11].

**Re claim 19:** Lof discloses a liquid supply system [see Fig 2] which has a supply port 13, the liquid supply system supplying a liquid 11 onto the substrate to form a liquid immersion area [at liquid 11] on a portion of a surface of the substrate during the exposure,

wherein the substrate is exposed through the liquid with exposure light [from source LA].

**Re claim 20:** Lof discloses a device manufacturing method [see Fig 1] comprising:

exposing, through a liquid 11, a substrate W held on a holder WT of a stage apparatus according to claim 1; and

processing the exposed substrate [Par 0009: other procedures and various processes].

### ***Response to Arguments***

10. Applicant's arguments with respect to claims 1 and 14 have been considered but are moot in view of the new ground(s) of rejection. See the above rejection.

### ***Conclusion***

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

Art Unit: 2851

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Liu whose telephone number is 571-272-9019. The examiner can normally be reached on Monday through Friday 9 am - 5 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diane Lee can be reached on 571-272-2399. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Michael Liu  
Examiner  
Art Unit 2851

ML 7/9/08

/Diane I Lee/  
Supervisory Patent Examiner, Art Unit 2851